

REMARKS

In the last Office Action the claims were objected to and claims 12-22 inclusive were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 12-16 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Engle et al. in view of Fujioka et al. Claims 17 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Engle et al. in view of Fujioka et al. and further in view of Hsien et al. Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Engle et al. in view of Fujioka et al. and further in view of GB-231 22 60. Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Engle et al. in view of Fujioka et al. and GB-231 22 60 and further in view of Hsien et al. Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Engle et al. in view of Fujioka et al. and further in view of Hsein et al. and Larsen.

Claims 12-22 inclusive have been amended to overcome the objections and the rejection under 35 U.S.C. § 112, second paragraph. Reconsideration and allowance of the application is respectfully requested in view of the following remarks.

With respect to the objection to claim 12 it would be improper to change “to solenoid valve units” in line 10 to --two solenoid valve units--. In the fifth paragraph of claim 12 it is stated that each of the slave control units is connected to both said transmission lines, to solenoid valve units and to sensor devices. Thus the elements being connected are set forth and not the number of units.

Independent claim 12 has been rejected as being unpatentable over Engle et al. in view of Fujioka et al.

Engle discloses a communication and control system for a train 20 comprising a plurality of train sections 22 and 23. Each train section comprises a pair of locomotives 26 and 28, one at each end of the section, and a plurality of cars or carriages 30 connected therebetween. One of the control cabs or locomotives is considered the master, while the other is the slave (col. 2, lines 62, 63). In each locomotive 26, 28 a microprocessor controller 74 is associated with the respective engine 52 and is connected to sensors 72 and control devices 72, 102, and to a serial bus 82 (figure 3), which extends through the train section and is connected to the controller associated with the engine of the other locomotive. In each of the carriages various detectors are connected to said serial bus 82, such as a brake status sensor 86 (figure 3 and col. 4, lines 58-60). However the cars or carriages are not provided with any respective electronic slave control units.

Claim 12 relates to a communication and control system for a train which may comprises one or more engines or locomotives. First and second bi-directional transmission lines extend along the train, and a main control unit is installed on the engine or locomotive and is connected to said information transmission lines.

As mentioned above, Engle discloses a system wherein information communication takes place between one master control unit and a corresponding one slave unit only, both the said master and slave units being installed on a locomotive (col. 2, lines 62-63). No slave control units are provided on the cars or carriages.

In the system according to Claim 1 information communication takes place between a master control unit, installed on a locomotive, and a plurality of slave control units, each of which is installed on a respective carriage.

Contrary to the Examiner's allegation, Engle does not disclose any slave control units on the carriages. Furthermore, Engle also does not disclose slave control units which, in the respective carriages, are connected to solenoid valve units associated with pneumatic brake actuators, as well as to sensors devices associated with the carriage, as recited in Claim 12. Engle also does not disclose a main control unit arranged to transmit to the valve control units of the carriages serial brake control signals and to receive and acquire information or state signals coming from the slave control units of the carriages.

Instead, Engle discloses a system wherein the brakes of the carriages are controlled pneumatically, through a main reservoir pipe 92 and a brake pipe 94 (col. 5, lines 39-41 and Figure 3). The pneumatic transmission of a brake control signal along the train, as in Engle, is not as quick and immediate as with the transmission of serial electric control signals from the main control unit to each slave control unit of the system according to the present invention. Furthermore, in the system of the invention, braking occurs almost simultaneously in all carriages, whereas in the pneumatic system of Engle the propagation of the pneumatic brake signals occurs with an appreciable delay, which may represent a serious inconvenience, particularly for very long trains.

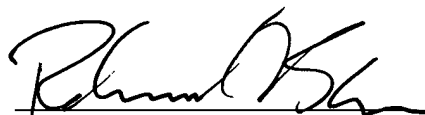
In view of the foregoing distinctions between the present invention as defined in claim 12 and teachings of Engle and Fujioka it is submitted that claim 12 would not be the least bit obvious in view of the teachings of Engle and Fujioka. The patent to Engle et al. is directed to entirely different system and the combination of the solenoid valves of Fujioka et al. with Engle et al. would not be obvious and even if the combination was made the basic structure of the

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Engle et al. system would still fall far short of meeting the limitations of claim 12. Since all of the remaining claims are dependent directly or indirectly from claim 12 it is submitted that the dependent claims would be allowable for the same reasons set forth above with respect to claim 12. Therefore it is respectfully requested that claims 12-22 inclusive be allowed and the application passed to issue forthwith.

If for any reason the Examiner is unable to allow the application on the next Office Action and feels that an interview would be helpful to resolve any remaining issue, the Examiner is respectfully requested to contact the undersigned attorney for the purpose of arranging such an interview.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Robert V. Sloan', written over a horizontal line.

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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

--12. (Amended) A communication and control system in combination with a railway train which comprises at least one main engine and a plurality of carriages or wagons, the communication and control system comprising

a first and second bi-directional transmission lines which extend parallel to and spaced from one another along the train;

a main control unit installed on said at least one main engine and connected, in said at least one main engine, to both said transmission lines and to brake control systems or devices of the train;

a plurality of slave control units each of which is installed upon a respective carriage or wagon and is connected, in the respective carriage or wagon, to both said transmission lines, ^{first} to solenoid valve units associated with pneumatic brake actuators, ~~as well as~~ and to sensor devices associated with the respective carriage or wagon;

the main control unit and the slave control units being arranged to communicate with one another via said transmission lines according to a predetermined serial protocol;

the main control unit being arranged to transmit to the slave control units serial brake control signals ~~of serial type~~, and to receive and acquire serial information or ~~state status~~ signals ~~likewise or serial type~~ from said slave control units via at least one of said transmission lines.

13. (Amended) The system according to Claim 12 further comprising at least one auxiliary engine;

said at least one auxiliary engine being also provided with a control unit capable of acting as a slave control unit connected to said transmission lines and arranged to receive synchronization signals coming from ^{confusingly main control unit} the control unit of the lead engine and to transmit information or ^{diff from cl. 12} state-status signals to the main control unit of the at least one main engine via at least one of said transmission lines.

14. (Amended) The system according to Claim 12, wherein the main control unit is arranged to transmit brake control signals to the slave control units via one of said transmission lines and to receive information signals coming from said slave control units via the other of said transmission lines.

15. (Amended) The system according to Claim 12, wherein the main control unit is arranged to detect and determine the location along the train of ~~the~~ a position of a failure of one of said transmission lines.

16. (Amended) The system according to Claim 15, wherein the main control unit is arranged, in ~~the case of~~ a failure of one of said transmission lines, to transmit at least the brake control signals and possible synchronization signals for one or more auxiliary engines on the other of said transmission lines.

17. (Amended) The system according to Claim 12, wherein the slave control units are arranged to acquire and transmit brake control or information signals on one or the other transmission line equally, and are moreover operable, when the slave control units receive a

brake control signal, to transfer to the other transmission line brake control or information signals received on one line; the main control unit being arranged to detect a condition in which said transmission lines are both interrupted, each between different pairs of slave control units, and ~~in such a case~~ provide a transfer command signal to send brake control signals to at least two slave control units from among those in which there is an interruption of one of said transmission lines, in such a way that all the slave control units are able to communicate with the main control units via a provisional transmission line comprising portions of both said transmission lines and the slave control units which have been sent said brake control signals.

18. (Amended) The system according to Claim 12~~7~~, wherein said transmission lines are further connected to electrical power supply devices which can be activated in at least one engine to distribute ~~the~~ power to the slave control unit.

19. (Amended) The system according to Claim 17, wherein the slave control units are arranged to allow the passage of electrical power from one transmission line to the other which are connected, when the slave control units receive said transfer command signal, in such a way that when both said transmission lines are interrupted, each between different pairs of slave control units, all said slave control units can be supplied with electrical power propagated through said provisional transmission line.

21. (Amended) The system according to Claim 12, wherein the system operates in trains comprising one or more vehicles-carriages or wagons provided with a single transmission line.--